

## ICE-MAKING MACHINE

This application claims priority to UK patent application number 0304073.0, filed February 24, 2003, and entitled "Ice-Making Machine".

The present invention relates to an ice-making machine and more particularly to a machine for making ice cubes.

A number of machines have been used or proposed hitherto for making ice cubes, but these are generally of complicated or bulky construction. I have now devised an ice-making machine which is of simple construction and compact form, which can make a significant quantity of ice cubes in a relatively short period of time: the machine is particularly useful for hotel, bar, leisure or domestic use.

In accordance with the present invention, there is provided an ice-making machine which comprises an ice-cube casting unit which is generally horizontally-disposed and has a plurality of compartments which are open at their bottoms, a closure member for sealing against the underside of the ice-casting unit to close the bottoms of said compartments, means for filling said compartments with water, cooling means for freezing the water in said compartments, and means for moving said closure member to a downwardly-inclined position to allow ice cubes to fall from said compartments and slide down into a receptacle.

In use, the ice-casting compartments are filled with water, whilst their

bottoms are closed by the closure member. The water in these compartments is then frozen, following which the closure member is moved to its downwardly-inclined position, so that the ice cubes can fall from their compartments and slide into a receptacle positioned at the lower end of the downwardly-inclined closure member.

Preferably the closure member is pivotally mounted and preferably a motor-driven or solenoid-operated device is provided to move the closure member between its raised and lowered positions.

Preferably the tops of the ice-casting compartments are open. Preferably the machine includes a water reservoir and means for pumping water, or for the gravity-feed of water, from this reservoir and into the ice-casting compartments.

Preferably coolant tubes run alongside the ice-casting compartments and may be formed integrally with, or rebated or otherwise incorporated into, the walls of these compartments: preferably the ice-casting compartments are arranged in a number of rows, with the coolant tubes running alongside the respective rows and preferably between adjacent rows. Preferably each row of compartments is formed by a pair of side walls and a number of spaced-apart partitions extending between the side walls.

Preferably heating means are provided, for heating the sides of the ice cubes sufficiently to release them from their ice-casting compartments. Preferably the heating means comprises electrical heating wires running

adjacent the outsides of the ice-casting compartments; the heating means may instead be arranged to use residual heat from the compressor.

Preferably the coolant tubes form the evaporator of a refrigeration system of the ice-making machine.

Preferably the machine includes a control system for controlling an operating cycle; when the user initiates an operating cycle, the ice-casting compartments are filled with water, then the cooling means is actuated to freeze the water in the compartments, and finally the closure member is lowered to allow the ice cubes to fall onto closure member and slide into the ice-cube receptacle. The control system preferably includes a timer which lowers the closure member a predetermined time period after the ice-casting compartments are filled with water.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

An embodiment of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:

FIGURE 1 is a schematic section through an ice-making machine in accordance with the invention;

FIGURE 2 is an isometric view of the ice-casting unit of the machine;  
and

FIGURE 3 is a cut-away view of the ice-casting unit shown in Figure 2.

## DESCRIPTION

Referring firstly to Figure 1 of the drawings, there is shown an ice-making machine which comprises a housing or cabinet 10 having a front panel 11 provided with controls 12 for the user. An ice-casting unit 20 is mounted horizontally within the cabinet 10, adjacent its top. A closure member 13 (shown here as a plate) is provided below the ice-casting unit 20 and is pivoted along its rear edge 13a, so that it can be moved between the downwardly-inclined position shown, and a raised position in which it seals against the underside of the ice-casting unit 20. A device 14, driven by an electric motor 15 controlled by a timer 14a, is provided for lifting and lowering the closure member 13.

In the downwardly-inclined position shown, the closure member 13 forms a slipway for ice cubes, falling from the underside of the ice-casting unit, to pass to a receptacle 16 in the bottom front of the cabinet 10. A reservoir for water (not shown) is positioned alongside the ice-cube receptacle 16. A pump 17, for pumping water from the water reservoir to fill the ice-casting unit 20, is mounted in the cabinet 10. In the bottom rear of the cabinet, the compressor 18 of the refrigerating system is mounted.

Referring to Figures 2 and 3 of the drawings, the ice-casting unit 20 comprises a planar body formed with a number of rows of square ice-casting compartments C which are open both at their tops and at their bottoms: the

compartments C may be rectangular or of other desired shapes, instead of square. Coolant tubes 23 run through the walls between the adjacent rows of ice-casting compartments and through the walls alongside the outer two rows of ice-casting compartments; electrical heating wires 24 also run alongside the ice-casting compartments, spaced from the coolant tubes and insulated from them by the material of the walls of the compartments. The coolant tubes 23 form the evaporator part of the refrigerating system. In the example shown in Figure 2, the closure member 13 is in the form of a tray having a flat bottom, upstanding walls around its sides and rear, and an outwardly-sloping wall or lip at its forward end.

In use, when the user initiates an operating cycle of the machine, the motor 15 and associated device 14 lift the closure member 13 to seal the latter against the underside of the ice-casting unit 20, to seal across the bottoms of the ice-casting compartment C. Further, the pump 17 pumps water from the water reservoir and into the ice-casting compartments C, to fill these. Then the refrigerating system operates, circulating its cooling fluid through the evaporator coolant tubes 23 in order to cool the water in the ice-casting compartments. After a period of time, the water in these compartments freezes, to form ice cubes. The refrigerating system then closes down, the closure member 13 is lowered and current is passed through the electrical heating wires 24, to heat the sides of the ice cubes and melt these sufficiently to release the ice cubes from their compartments. The ice

cubes then fall onto the downwardly-inclined closure member 13 and slide down this and into the ice-cube receptacle.

It will be appreciated that the ice-making machine which has been described is of simple, self-contained construction and is effective in making a significant quantity of ice cubes in a relatively short time period.